

## REQUEST FOR ACCESS TO AN APPLICATION UNDER 37 CFR 1.14(e)

RECEIVED

MAR 19 2002

File Information Unit

In re Application of

Bergman et al

Application Number

09-061318

Filed

4-16-98

Art Unit

Examiner

Paper No. H26Assistant Commissioner for Patents  
Washington, DC 20231

1.  I hereby request access under 37 CFR 1.14(e)(2) to the application file record of the above-identified ABANDONED Application, which is not within the file jacket of a pending Continued Prosecution Application (CPA) (37 CFR 1.53(d)) and is: (CHECK ONE)

 (A) referred to in:United States Patent Application Publication No. 6,273,108, page       , line       ,United States Patent Number       , column       , line       , or

an International Application which was filed on or after November 29, 2000 and which

designates the United States, WIPO Pub. No.       , page       , line       . (B) referred to in an application that is open to public inspection as set forth in 37 CFR 1.11(b) or1.14(e)(2)(i), i.e., Application No.       , paper No.       , page       , line       .

2.  I hereby request access under 37 CFR 1.14(e)(1) to an application in which the applicant has filed an authorization to lay open the complete application to the public.

Amber click

Signature

319-02

Date

Amber click

Typed or printed name

FOR PTO USE ONLY

Approved by:       Unit:

United States Patent  
Bergman et al.

(10) Patent No.: US 6,273,108 B1  
(45) Date of Patent: Aug. 14, 2001

(54) APPARATUS AND METHOD FOR  
PROCESSING THE SURFACE OF A  
WORKPIECE WITH OZONE

(75) Inventors: Eric J. Bergman; Mignon P. Hess,  
both of Kalispell, MT (US)

(73) Assignee: Semitool, Inc., Kalispell, MT (US)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/677,929

(22) Filed: Oct. 3, 2000

Related U.S. Application Data

(60) Division of application No. 09/061,318, filed on Apr. 16,  
1998, which is a continuation-in-part of application No.  
08/853,649, filed on May 9, 1997.

(51) Int. Cl. 7 ..... B08B 3/02

(52) U.S. Cl. ..... 134/102.1; 134/95.3; 134/105;  
134/902; 134/111; 134/103.1

(58) Field of Search ..... 134/94.1, 95.1,  
134/95.2, 95.3, 99.2, 102.1, 103.1, 105,  
107, 108, 111, 102

(56) References Cited

U.S. PATENT DOCUMENTS

4,695,327 9/1987 Grebinski.  
4,778,532 \* 10/1988 McConnell et al.  
4,899,767 \* 2/1990 McConnell et al.

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

0 344 764 12/1989 (EP).  
0 548 596 A2 6/1993 (EP).  
0 702 399 3/1996 (EP).  
2 287 827 9/1995 (GB).  
52-12063 4/1977 (JP).

OTHER PUBLICATIONS

Translation/Abstract of Japanese Appln. No. 1984-125760  
published Jan. 10, 1986.

Heyns, M.M., et al. "New Wet Cleaning Strategies for  
Obtaining Highly Reliable Thin Oxides," MRP Symposium  
Proceedings on Materials Research Society, Spring Meeting,  
San Francisco, CA Apr. 12-13, 1993, p. 35 (1993).

Adler, Marilyn Grace and Hall, George Richard, "The  
Kinetics and Mechanism of Hydroxide Ion Catalyzed Ozone  
Decomposition in Aqueous Solution" *J Am. Chem. Soc.*, vol.  
72, pp. 1884-1886, 1950.

Nelson, Steve, "Ozonated water for photoresist removal"  
*Solid State Technology*, pp. 107-112 (Jul. 1999).

Christenson, Kurt K., et al. "Deionized Water Helps Remove  
Wafer Stripping 'Resist'-ance," [www.precisioncleaningweb.com](http://www.precisioncleaningweb.com)—Precision Cleaning Web—Archives, pp. 10-20 (Apr.  
1998).

Sehested, K., et al., "Decomposition of Ozone in Aqueous  
Acid Solutions (pH 0-4)," *J. Phys. Chem.*, pp. 1005-1009  
(1992).

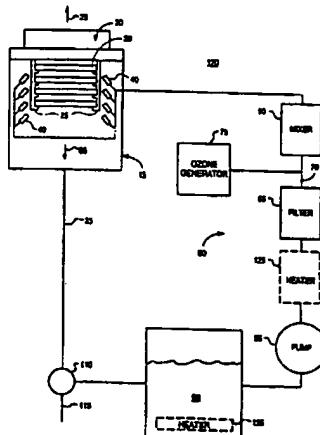
(List continued on next page.)

Primary Examiner—Frankie L. Stinson  
(74) Attorney, Agent, or Firm—Lyon & Lyon LLP

(57) ABSTRACT

An apparatus for supplying a mixture of a treatment liquid and ozone for treatment of a surface of a workpiece, and a corresponding method are set forth. The preferred embodiment of the apparatus comprises a liquid supply line that is used to provide fluid communication between a reservoir containing the treatment liquid and a treatment chamber housing the workpiece. A heater is disposed to heat the workpiece, either directly or indirectly. Preferably, the workpiece is heated by heating the treatment liquid that is supplied to the workpiece. One or more nozzles accept the treatment liquid from the liquid supply line and spray it onto the surface of the workpiece while an ozone generator provides ozone into an environment containing the workpiece.

21 Claims, 6 Drawing Sheets



BEST AVAILABLE COPY